1 XN FANOUT WAVEGUIDE PHOTODETECTOR

ABSTRACT OF THE DISCLOSURE

A 1 x N fanout waveguide detector is disclosed. The detector includes a multiple-mode interference (MMI) cavity with input and output ends. A single-mode waveguide is optically coupled to the input end of the MMI cavity so that the optical power in the guided mode is distributed over N modes. The MMI cavity forms N interference nodes at or near its output end. N waveguide detectors are optically coupled to the output end at or near the N interference nodes. The waveguide detectors each have a waveguide that is evanescently coupled to an intrinsic region of a PIN detector. The width of the detector waveguide core, which can be sub-micron, defines the carrier collection distance between the electrodes of the PIN detector. Further, the length of the detector waveguide can be selected to maximize optical absorption to provide optimum quantum efficiency. The waveguide detectors are connected in parallel to provide a high-output photocurrent.